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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PATTON BOGGS LLP 1801 CALIFORNIA STREET SUITE 4900 DENVER, CO 80202			EXAMINER CHEN, KEATH T	
			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/563,519

Applicant(s)

SNEH, OFER

Examiner

KEATH T. CHEN

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Applicant's submission, filed on 04/23/2010, addressing claims 1-11 and 16 rejection from the non-final office action (01/26/2010), by argument and affidavit only without claim amendment is acknowledged and will be addressed below.

Response to Affidavit

2. The declaration under 37 CFR 1.132 filed on 04/23/2010 is insufficient to overcome the rejection of claims 1-11 and 16 based upon '146, '025, '603, and '258, as set forth in the non-Final Office action (01/26/2010) because:

a. In item 5, Affiant asserting that "I specifically attributed the commercial success to the features in the claims" as "**evidence** that attributes commercial success to the features of the claim in the instant application".

As stated in MPEP 716.03. For example, "Objective evidence of nonobviousness including commercial success must be commensurate in scope with the claims", 716.03(a)

"In considering evidence of commercial success, care should be taken to determine that the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is not the result of heavy promotion or advertising, shift in advertising, consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention ... conclusory statements or opinions that

increased sales were due to the merits of the invention are entitled to little weight)" 716.03(b).

b. Items 6-9: Affiant asserts that a thousand fold increase in the speed of the ALD by the claimed structure of FRE/PCC/FRE/PUMP in previous affidavit item 28 filed on 12/22/2009.

The examiner maintains that the long felt need and commercial success of the apparatus is acknowledged, as discussed in the previous office action (01/26/2010). However, Affiant has not provided **evidence** that attributes the commercial success to the feature of the claim in the instant Application. Furthermore, the commercial success must be commensurate **in scope with the claims**. Note the examiner has demonstrated in the rejection in previous office action that the claims read into much broader apparatus than the Applicant's drawing.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 3-5, 7-11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bhatnagar et al. (US 6391146, hereafter '146), in view of Halsey et al. (US 6663025, hereafter '025) and Heinze (US 2028603, hereafter '603),.

4. '146 teaches some limitations of:

5. Claim 1: An apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82 from Fig. 1 and downstream parts)

for controlling the pressure in a process chamber (affecting the pressure of the chamber from downstream because they are in fluidic communication, similar to Applicants apparatus), said apparatus comprising: a pressure control chamber (PCC) (exhaust tube #85, similar to exhaust tube shown in various figures in instant application); a gas source (one of the #235, col. 7, lines 37-40); a flow controlling device (one of the mass flow controller MFC #240, col. 8, lines 6-7) in serial fluidic communication downstream from said gas source and upstream from said PCC for controlling the PCC pressure (by controlling MFC #240) and the pressure in said process chamber (the pressure in #85 affects the pressure in the process chamber), a vacuum pump (#125, col. 3, line 66) for creating a sub atmospheric pressure in said apparatus.

6. '146 does not teaches the other limitations of:

7. Claim 1: a first flow restricting element (FRE), wherein said first FRE is an immobile flow restricting element; said first FRE located in serial fluidic communication with said process chamber and downstream from said process chamber; (a pressure control chamber PCC) located in serial fluidic communication downstream from said first FRE; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element, (a vacuum pump) downstream from said second FRE.

8. '025 is an analogous art in the field of manufacturing of semiconductor devices using plasma (field of the invention; similar to '146, col. 1, lines 53-56 and col. 3, line

13), particularly in rapid cycling of venting and pumping gas (col. 2, lines 39-41; similar to '146 effluent gas treatment, abstract). '025 teaches an immobile diffuser (#200, Fig. 4A or 4B, altering the direction of the flow, therefore, a flow restricting element) at the bottom of the chamber (see Fig. 3A).

9. '603 is an analogous art in the field of turbo pump (title, right col. of page 2, line 40). '603 teaches a screen/flow restricting element (#44, Fig. 7, right col. of page 2, lines 65 to 75).

10. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have added a diffuser (the claimed first immobile FRE), as taught by '025, to the bottom of chamber in Fig. 1 of '146, therefore, the first FRE downstream of the process chamber and upstream of Fig. 4 of '146. Furthermore, to have added a screen (the claimed second FRE) in front of pump (#125 of '146).

11. The motivation to add an immobile diffuser/flow restrictor is to provide a rapid cycle in venting and pumping gas, as taught by '025 (col. 2, lines 39-41), and to reduce minute particle contamination (col. 3, lines 26-28). The motivation to add screen/second immobile FRE in front of pump is to remove particles, as taught by '603, (right col. of page 2, lines 72-75).

12. '146 also teaches some limitations of:

13. Claim 5 (besides the limitations of claim 1): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication with said process chamber and upstream from said process chamber; an upstream flow control device (the valve as shown in Fig. 1, not labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

14. Claim 16 (besides the limitations of claim 1): (b) a pressure control chamber (PCC) (#210, gas energized reactor); (d) a gas source (one of the #235, col. 7, lines 37-40); (e) a flow controlling device (one of the control valve #240) in serial fluidic communication downstream from said gas source and upstream from said PCC for controlling the PCC pressure and the pressure in said process chamber; (f) a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; (g) an abatement element (#226a-b, electrode) located within said PCC; and (h) a vacuum pump (#125, col. 3, line 66) for creating a sub atmospheric pressure in said apparatus.

15. '146 does not teaches the other limitations of:

16. Claim 5: a first flow restricting element (FRE) located in serial fluidic communication downstream from said process chamber, wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication

downstream from said PCC, wherein said second FRE is an immobile flow restricting element, (a vacuum pump) downstream from said second FRE.

17. Claim 16: (a) a first flow restricting element (FRE) located in serial fluidic communication downstream from said process chamber, wherein said first FRE is an immobile flow restricting element; (b) b) (a pressure control chamber PCC) located in serial fluidic communication downstream from said first FRE; (c) a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element; (h) (a vacuum pump) downstream from said second FRE.

18. For substantially the same reason as claim 1 rejection above, claims 5 and 16 are rejected.

19. '146 also teaches the limitations of:

20. Claims 4 and 8: An apparatus as in claim 1 (or a wafer processing apparatus as in claim 5); said process chamber (#25) and said PCC (#85) are formed as compartments within a single process vessel (#200, #85, and wall of chamber #25 are connected into a single vessel).

21. '146 does not teaches the limitations of:

22. Claims 4 and 8: said first FRE is formed within the partition between said process chamber (#25) and said PCC (#85).

23. In the above combination, '025 teaches the diffuser/first FRE (#200 imported into '146) is formed within the partition between said process chamber (#25, particularly the plasma region #35 in Fig. 1 of '146) and said PCC (#85).

24. '146 also teaches the limitations of:

25. Claim 9: A wafer processing apparatus as in claim 5 wherein said wafer processing apparatus comprises a low pressure chemical vapor deposition LPCVD (col. 12, line 35, CVD; col. 3, line 39, low pressure).

26. Claim 10: A wafer processing apparatus as in claim 5 wherein said wafer processing apparatus comprises a reactive ion etching RIE apparatus (col. 4, line 4 and col. 3, line 40, plasma etching is RIE).

27. Claim 11: A wafer processing apparatus as in claim 5 wherein said wafer processing apparatus comprises a plasma enhanced chemical vapor deposition PECVD apparatus (col. 3, line 40).

28. For claims 9-11, applicant's claim requirements "LPCVD", "RIE", and "PECVD" are considered intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural

difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

29. '146 further teaches the limitations of:

30. Claims 3 and 7: An apparatus as in claim 1 (or a wafer processing apparatus as in claim 5), and further comprising: an abatement chamber (#210, gas energized reactor); a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said abatement chamber; and an abatement element (#226a-b, electrode) located within said abatement chamber.

31. '146 does not teach the limitations of:

32. Claims 3 and 7: A third FRE connected in serial fluidic communication downstream from said PCC; (an abatement chamber) connected in serial fluidic communication upstream from said third FRE

33. '146 further teaches a throttle valve at the inlet #211 to prevent backflow (col. 6, lines 35-38). At the time the invention was made, it would have been obvious to a person of ordinary of skill in the art to have added an additional throttle valve between the outlet (#212, Fig. 4) and pumps (#125) to further prevent backflow of effluent (#100). This additional throttle valve would have been a third FRE downstream from said

PCC(#85) and the abatement chamber (#210) upstream from said third FRE.

34. Motivation would have been to further prevent backflow of effluent, as taught by '146 (col. 6, lines 35-38).

35. '146 discloses the claimed invention except for an additional throttle valve. It would have been an obvious matter of design choice to duplicate the throttle valve, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

36. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '146, in view of '025 and '603 (note the mapping is different from the rejection above).

37. '146 teaches the limitations of:

38. Claim 1: An apparatus (Fig. 4, abatement system #200, col. 8, line 26, part of the system of Fig. 1, including the throttle valve #82 and parts downstreams) for controlling the pressure in a process chamber (affecting the pressure of the chamber from downstream because they are in fluidic communication, similar to Applicants apparatus), said apparatus comprising: a pressure control chamber (PCC) (#210, gas energized reactor); a gas source (one of the #235, col. 7, lines 37-40); a flow controlling device (one of the mass flow controller MFC #240, col. 8, lines 6-7) in serial fluidic communication downstream from said gas source and upstream from said PCC for controlling the PCC pressure (by controlling MFC #240) and the pressure in said process chamber (the pressure in #85 affects the pressure in the process chamber), a

vacuum pump (#125, col. 3, line 66) for creating a sub atmospheric pressure in said apparatus.

39. Claim 5 (besides the limitations of claim 1): A wafer processing apparatus comprising a process chamber (Fig. 1, #25), a process reactive gas supply line (line connects between #70 and nozzle #72) from a process gas source (#70, col. 3, lines 36-38) in serial fluidic communication with said process chamber and upstream from said process chamber; an upstream flow control device (the valve as shown in Fig. 1, not labeled) located in serial fluidic communication upstream from said process chamber and downstream from said process gas source.

40. '146 does not teaches the limitations of:

41. Claim 1: a first flow restricting element (FRE), wherein said first FRE is an immobile flow restricting element; said first FRE located in serial fluidic communication with said process chamber and downstream from said process chamber; (a pressure control chamber PCC) located in serial fluidic communication downstream from said first FRE; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting element, (a vacuum pump) downstream from said second FRE.

42. Claim 5: a first flow restricting element (FRE) located in serial fluidic communication downstream from said process chamber, wherein said first FRE is an immobile flow restricting element; a second FRE located in serial fluidic communication downstream from said PCC, wherein said second FRE is an immobile flow restricting

element, (a vacuum pump) downstream from said second FRE.

43. '025 and '603 are analogous arts as discussed above. For substantially the same reason as discussed above in previous claim 1 rejection, claims 1 and 5 are also rejected by this different mapping of '146 in view of '025 and '603.

44. '146 does not teaches the limitations of:

45. Claims 2 and 6: An apparatus as in claim 1 (or a wafer processing apparatus as in claim 5), and further comprising: a reactive gas source (the second #235, col. 8, lines 12-13) connected in serial fluidic communication upstream from said PCC; and an abatement element (#226a-b, electrode) located within said PCC.

46. Claims 1, 3-5, 7-11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over '146, in view of Strang (US 20030227258, hereafter '258) and '603.

47. '146 teaches some limitations and does not teach the other limitations of claims 1, 5, and 16 as discussed above.

48. '603 is an analogous art as discussed above.

49. '258 is an analogous art in the field of plasma reactor chamber (title), particularly in tunable chamber vacuum characteristic ([0002]) with exhaust orifice plate ([0008]; similar to '146 effluent gas treatment, abstract). '258 teaches an immobile orifice plate (#17, fig. 1, [0028], or #40, Fig. 2, [0030]) that surrounds chuck #14 and seals against

the wall of reactor chamber #12.

50. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have added an orifice plate (the claimed first immobile FRE), as taught by '258, to the bottom of chamber in Fig. 1 of '146, therefore, the first FRE downstream of the process chamber and upstream of Fig. 4 of '146. Furthermore, to have added a screen (the claimed second FRE) in front of pump (#125 of '146).

51. The motivation to add orifice plate is to change the flow field within the reactor chamber, as taught by '258 ([0028]).

52. Claims 3, 4, 7-11 are rejected for substantially the same reason as discussed in rejection by the combination of '146, '025, and '603 above.

53. Claims 1-2 and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over '146, in view of '258 and '603 (note the mapping is different from the rejection immediately above).

54. '146 teaches some limitations and does not teach the other limitations of claims 1 and 5 as discussed above.

55. Claims 1-2 and 5-6 are rejected for substantially the same reason as discussed in rejection by the combination of '146, '025, and '603 above; instead of '025, using '258 as discussed immediately above.

Response to Arguments

56. Applicant's arguments filed on 04/23/2010 have been fully considered but they are not persuasive.

57. Applicant complains that the connection between the specific features claimed and the speed is already given in the specification and perhaps missed by the examiner, see the second paragraph of page 6 and the last paragraph of page 7.

This argument is found not persuasive.

The examiner already pointed out the long felt need and commercial success of the apparatus is acknowledged in the previous office action (01/26/2010). The examiner considered Affiants statement and clearly point out lack of **evidence** that attributes the commercial success to the feature of the claim in the instant Application. To further clarifies, the examiner cites MPEP 716.03 to remind Applicants that "conclusory statements or opinions that increased sales were due to the merits of the invention are entitled to little weight." Particularly the claim is much broader than Applicants' drawing.

58. Applicant repeatedly argue that nothing in any reference suggests that a diffuser of Halsey '025, a screen of Heinze '603, or an adjustable orifice plate of Stang '258, would make a suitable **substitute** for a throttle valve, no one skill in the art would replace a throttle valve with this plate, see the second paragraph of page 7.

This argument is found not persuasive.

The examiner again point out the rejection is based on **addition** of a diffuser, a screen or an adjustable orifice plate, see the rejection in previous office action (01/26/2010) or from above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEATH T. CHEN whose telephone number is (571)270-1870. The examiner can normally be reached on 6:30AM-3 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T. C./
Examiner, Art Unit 1712

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1712